

## **“ECONOMY-CLASS SYNDROME”: THE MYTH AND THE FACTS**

Deep vein thrombosis (DVT) is a condition in which a thrombus (blood clot) develops in the deep veins, usually of the leg. The condition itself is not dangerous, but the complication of a clot moving to the lung (pulmonary embolism) or elsewhere in the body, venous thromboembolism, (VTE) can be life-threatening.

The term “economy-class syndrome” was first used in 1977. This description mistakenly implies that DVT does not occur in business- or first-class air travelers, or in travelers using other forms of long-distance travel, or indeed in non-travelers. In fact, in a published study in 1988 on this very subject, two of the cases were authors of the study, and paradoxically, one of the authors with DVT had traveled in business-class.

It is known that up to 20% of the total population may have some degree of increased clotting tendency. The traveling public is drawn from the general population and because of preexisting risk factors, it follows that some air travelers are at risk of developing DVT when, or soon after, traveling. However, there have been no studies published which show a statistically significant increase in cases of DVT when traveling in the absence of preexisting risk factors.

Since there have been no good prospective studies published on this subject, the evidence linking DVT or VTE with flying is circumstantial. Whether DVTs and VTEs that occur in association with airline travel simply result from prolonged immobility in an individual with predisposing risk factors, or whether there is a causal or contributory relationship with the aircraft cabin environment is not known.

Risk factors for the development of DVT include the following and are rated high or moderate:

### **High**

- Blood disorder affecting clotting tendency
- Impairment of blood clotting mechanism, such as clotting factor abnormality
- Cardiovascular disease
- Current or history of malignancy
- Major surgery within the past 6 weeks
- Recent trauma to lower limbs or abdomen
- Prolonged immobilization (>1 day)
- Personal or family history of DVT
- Pregnancy.

### Moderate

- Estrogen hormone therapy, including oral contraception
- Age above 40 years
- Tobacco smoking
- Obesity
- Varicose veins.

Other theoretical risk factors that have been suggested associating DVT with flying include dehydration, excessive alcohol, poor air quality, circadian dysrhythmia, seasonal shifts, and hypoxia. However, there is little experimental or epidemiological evidence to support any of these theories.

For passengers with no identifiable risk factors, it is recommended that they carry out frequent and regular stretching exercises, particularly of the lower limbs, during flight (see exercises below). Passengers should also take every opportunity to change position and to walk about the cabin. However, the relative risk of injury from being unrestrained during unexpected air turbulence has not been compared with the risk of developing DVT as a result of immobility.

For passengers with one or more identifiable risk factors the following recommendations should be noted:

- For those individuals over 40 years of age, those with active inflammation, such as arthritis, or those having had recent minor surgery within the last 3 days, they should follow the advice for passengers with no risk factors (above) and maintain proper hydration with or without support tights or non-elasticized long socks.
- For those individuals with varicose veins, uncontrolled heart failure, a heart attack within the past 6 weeks, on hormone therapy, blood disorders, pregnancy, lower limb paralysis, or lower limb trauma within the past 6 weeks, they should consult their own medical provider who may recommend the above with the possible addition of aspirin therapy and/or graduated compression stockings.
- For those individuals with a previous DVT/VTE, a known thrombophilia (a disorder which increases clot formation), major surgery within the past 6 weeks, a previous stroke, cancer, or a family history of DVT/VTE, they should consult with their own medical provider who may recommend the above with the possible addition of low molecular weight heparin (blood thinner) instead of aspirin.

### **IN-FLIGHT WORKOUT**

In-flight exercises are designed to provide a safe way to stretch and enjoy movement in certain muscle groups that can become stiff as a result of long periods of sitting. These exercises may be effective at increasing the body's blood circulation and massaging the muscles. Try to do these exercises for around 3–4 minutes every hour and occasionally get out of your seat and walk down the aisle (**be aware of the possibility of air turbulence and the potential for injury**). Each exercise should be done with minimal

disturbance to other passengers. None of the following exercises should be performed if they cause pain or cannot be done with ease.

- **Ankle Circles:** Lift feet off of the floor with legs stretched forward. Draw a circle with the toes, simultaneously moving one foot clockwise and the other foot counterclockwise. Reverse circles. Rotate in each direction for 15 seconds. Repeat if desired.
- **Foot Pumps:** Foot motion is in 3 stages.
  - Start with both heels on the floor and point feet upward as high as you can.
  - Put both feet flat on the floor.
  - Lift heels high, keeping balls of the feet on the floorRepeat these 3 stages in a continuous motion and in 30-second intervals.
- **Knee Lifts:** Lift leg with knee bent while contracting your thigh muscle. Alternate legs. Repeat 20–30 times for each leg.
- **Neck Roll:** With shoulders relaxed, drop ear to shoulder and gently roll neck forward and back, holding each position about 5 seconds. Repeat 5 times.
- **Knee to Chest:** Bend forward slightly. Clasp hands around the left knee and hug it to your chest. Hold stretch for 15 seconds. Keeping hands around the knee slowly let it down. Alternate legs. Repeat 10 times.
- **Forward Flex:** With both feet on the floor and stomach held in, slowly bend forward and walk your hands down the front of your legs toward your ankles. Hold stretch for 15 seconds and slowly sit back up.
- **Shoulder Roll:** Hunch shoulders forward, then upward, then backward, and downward, using a gentle circular motion.

Remember, until we know more about flying and the possible development of DVT/VTE, follow the above advice, drink plenty of water while avoiding alcohol consumption, and consult with your medical provider if you feel that you are at an increased risk of developing DVT/VTE.